

PATENT SPECIFICATION

(11) 1 454 173

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(54) IMPROVEMENTS IN AND RELATING TO PALLETS

5 (71) We, VEREINIGTE VERPACK-
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 liability company organized and existing
 under the laws of the Federal Republic of
 Germany, of 4 Industriestrasse, 4019
 Monheim, Germany, (assignee of
 HENKEL & CIE GMBH), do hereby
 declare the invention, for which we pray
 that a patent may be granted to us, and the
 method by which it is to be performed, to
 be particularly described in and by the
 following statement:—

10 The present invention relates to a process
 for the production of corrugated board
 pallets.

15 Generally, cardboard pallets are
 manually fitted together from separate
 parts or are folded from cardboard cut-out
 sections. Such methods are unsuitable for
 20 mass production. In addition to this, the
 stability of the cardboard pallets only
 satisfies relatively small demands.

25 The object of the invention therefore
 consists in providing a process for the mass
 production of corrugated board pallets.
 Furthermore, the pallets thus produced
 should have the greatest possible stability
 30 of shape in order that the pallets may also be
 loaded with relatively heavy goods.

35 According to the present invention there
 is provided a process for the production of a
 pallet having a corrugated board deck sheet
 and tubular supports comprising punching
 out flaps in the form of sectors of a circle in
 40 the deck sheet in a plurality of places
 concentrically positioning an outer and an
 inner tubular piece of a support at one of
 the said plurality of places on opposite sides
 of the deck sheet, and force fitting the inner
 45 tubular piece into the outer tubular piece
 with the flaps therebetween. Preferably,
 upper and lower deck sheets are provided
 respectively on opposite ends of the tubular
 pieces and each deck sheet is provided with
 50 flaps to fit between the inner and outer
 tubular pieces.

The tubular pieces are preferably made
 of cardboard or plastics material.

50 The inner tubular piece consists of two
 parts of approximately equal length, since
 the fastening of the support to the lower
 deck sheet of the pallet is effected
 separately from the fastening to the upper
 deck sheet.

55 In order to obtain the forced fit of the
 flaps in the annular space between the inner
 and outer tubular pieces necessary for the
 desired greatest possible stability of the
 pallet, it is expedient for the width of the
 60 annular space to be approximately 70 to
 90% of the thickness of the compressed
 corrugated board of the deck sheets of the
 pallet. Conveniently the inner tubular piece
 is pressed in with a pressure of
 65 approximately 10 to 15 kp per centimetre
 of circumference of the outer tubular piece.
 In order to adjust this favourable range of
 pressure, it is necessary to choose a
 corresponding width of the
 70 abovementioned annular space between the
 inner and outer tubular pieces. This choice
 can be found by experiment. Operation in
 this pressure range leads to an optimal
 pallet stability.

75 Preferably for the pallet stability the
 diameter of the outer tubular piece is
 approximately 70 to 100 mm. It has also
 been found that the resistance of the pallet
 support to possible damage during the
 handling of the pallet, say with a fork-lift
 truck, is greater in the case of diameters of
 the outer tubular piece in the said range
 than in the case of diameters of the tubular
 piece deviating therefrom.

80 According to our copending application
 No. 15441/76 (Serial No. 1,454,174) there is
 provided an apparatus for use in the process
 of this invention, said apparatus comprising
 a pneumatic pressing device and a table
 having means for supporting and positioning
 the deck sheet and outer tubular pieces in
 predetermined relation to one another, the
 pressing device being constructed as a
 pneumatically actuatable press punch which
 85 is mounted for movement substantially
 perpendicular to the plane of the table and

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for movement over the table, the press punch being dimensioned to receive the inner tubular piece thereon, the press punch and the inner tubular piece mounted thereon being insertable into the outer tubular piece and the end of the press punch facing the table being shaped as a truncated cone to facilitate the insertion of the flaps between the tubular pieces.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which Figure 1 is a side elevation of an apparatus for use in the process according to the present invention,

Figure 2 is a top view of the apparatus of Figure 1,

Figure 3 is an enlarged longitudinal section through the pressing device before the pressing process,

Figure 4 is the pressing device according to Figure 3 with inserted press punch,

Figure 5 is a top view of a pallet deck sheet with punched out flaps in the form of sectors of a circle, and

Figure 6 is a section through a finished pallet support. Referring to Figure 1 a pressing device constructed as a pneumatically actuatable press punch 1 is mounted in a vertical position on a stand 3 by means of levers 2a, 2b, for movement substantially perpendicular to and over a table 7. The levers 2a, 2b are pivotably connected at a joint 4 and the lever 2b is pivotable about a joint 5 on the stand 3. The levers 2a, 2b can be moved by means of a handle 6.

A number of plates 8a (Figure 3) for carrying outer tubular pieces 12 and centering pins 8b for supporting a deck sheet 15 and for guiding the press punch 1 are arranged on the table 7 in a disposition which corresponds to the provided arrangements of the supports on the pallet.

In use the effective part 9 of the punch 1 has an inner tubular piece 10 pushed thereon. The diameter of the press punch 1 is equal to the inside diameter of the tubular piece 10. The effective part 9 of the press punch with the pushed on inner tubular piece 10 is then inserted completely in the outer tubular piece 12 positioned by a spacer 11 on the centering pin 8b while previously formed sectors 13 (Figure 5) are forced by the action of the punch 1 and the tubular piece 10 between the tubular pieces 10 and 12 (Figure 4). In order to facilitate

this insertion, the press punch 1 is frustoconically shaped at its end 14. The exact centering of the press punch 1 within the outer tubular piece 12 is effected by the centering pins 8b and the spacers 11.

Before the pressing in of the tubular pieces 10 the pallet cover sheets 15 (Figures 5 and 6) are punched out to form the sectors 13, which when the press punch 1 is inserted are pressed in between the tubular pieces 10 and 12 and thereby give a very stable cohesion of the pallet support and pallet cover sheet 15.

It will be appreciated that when repeating the procedure illustrated in Figures 3 and 4 for the second deck sheet, the spacer 11 used will need to be of smaller diameter than illustrated so as to be a close fit within tubular piece 10 instead of within tubular member 12.

WHAT WE CLAIM IS:—

1. A process for the production of a pallet having a corrugated board deck sheet and tubular supports comprising punching out flaps in the form of sectors of a circle in the deck sheet in a plurality of places concentrically positioning an outer and an inner tubular piece of a support at one of the said plurality of places and force fitting the inner tubular piece into the outer tubular piece with the flaps therebetween.

2. A process as claimed in claim 1 in which upper and lower deck sheets are secured respectively on opposite ends of the tubular pieces and each deck sheet is provided with flaps to fit between the inner and outer tubular pieces.

3. A process as claimed in claim 1 or 2 in which the tubular pieces are made of cardboard or plastics material.

4. A process as claimed in any of claims 1 to 3 in which an annular space is formed between the inner tubular piece and the outer tubular piece having a width approximately 70 to 90% of the thickness of the compressed corrugated upper sheet of the pallet.

5. A process as claimed in any of claims 1 to 3 and/or 4 in which the inner tubular piece is pressed into the outer tubular piece with a pressure of approximately 10 to 15 kp per centimetre of the periphery of the outer tubular piece.

6. A process as claimed in any of claims 1 to 5, in which the diameter of the outer

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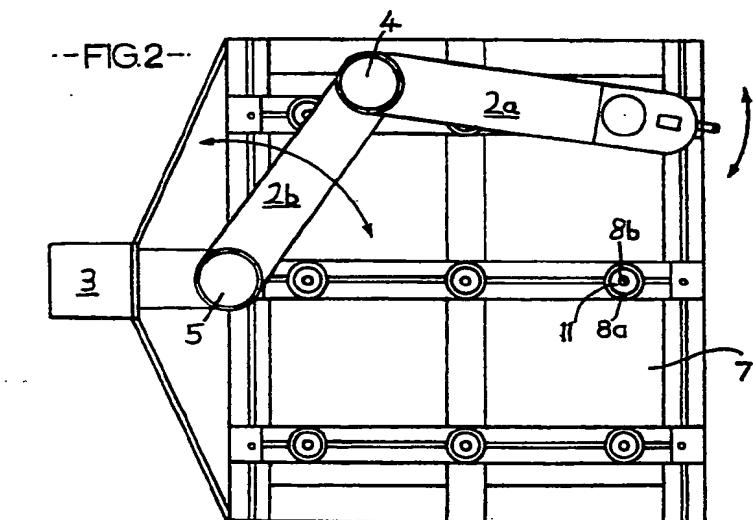
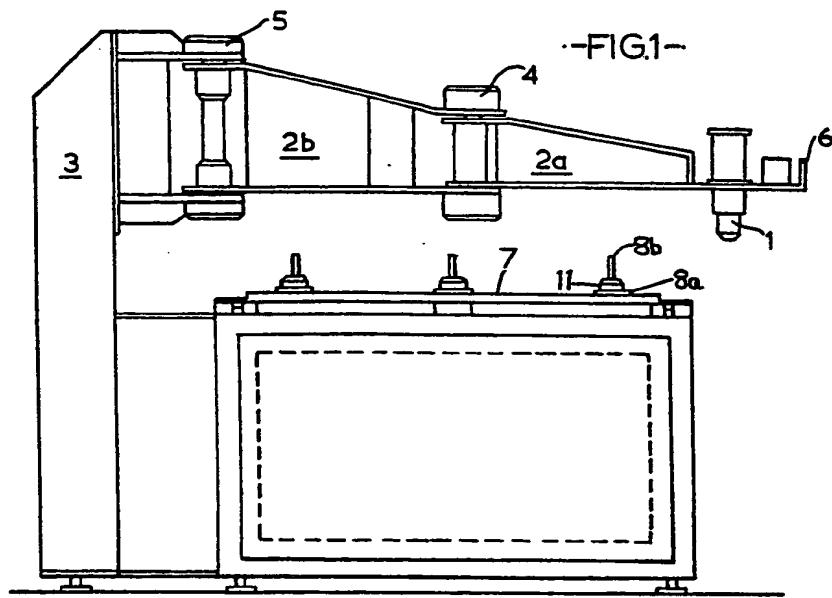
tubular piece is approximately 70 to 100 mm.

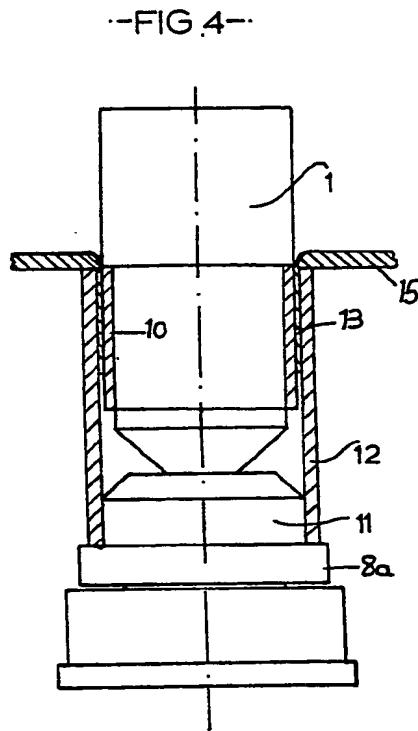
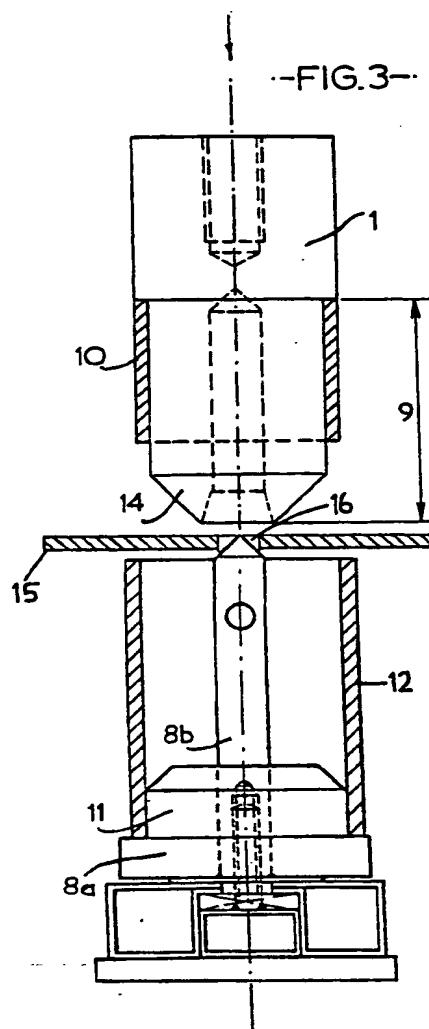
- 5 7. A process for the production of pallets substantially as hereinbefore particularly described with reference to the accompanying drawings.

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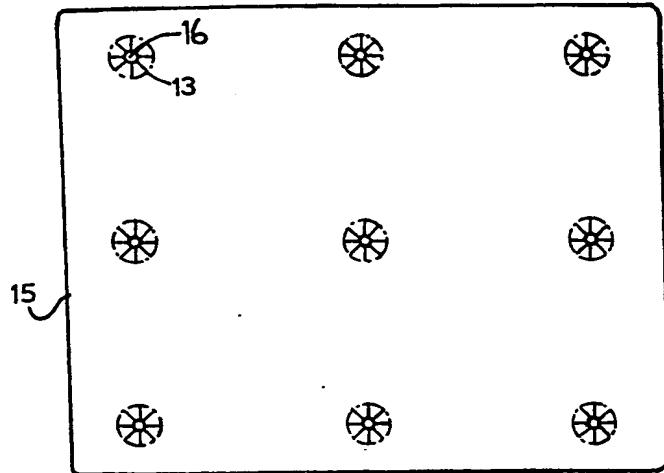
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--FIG.5--



--FIG.6--

